

# Coho Salmon Dependence on Intermittent Streams

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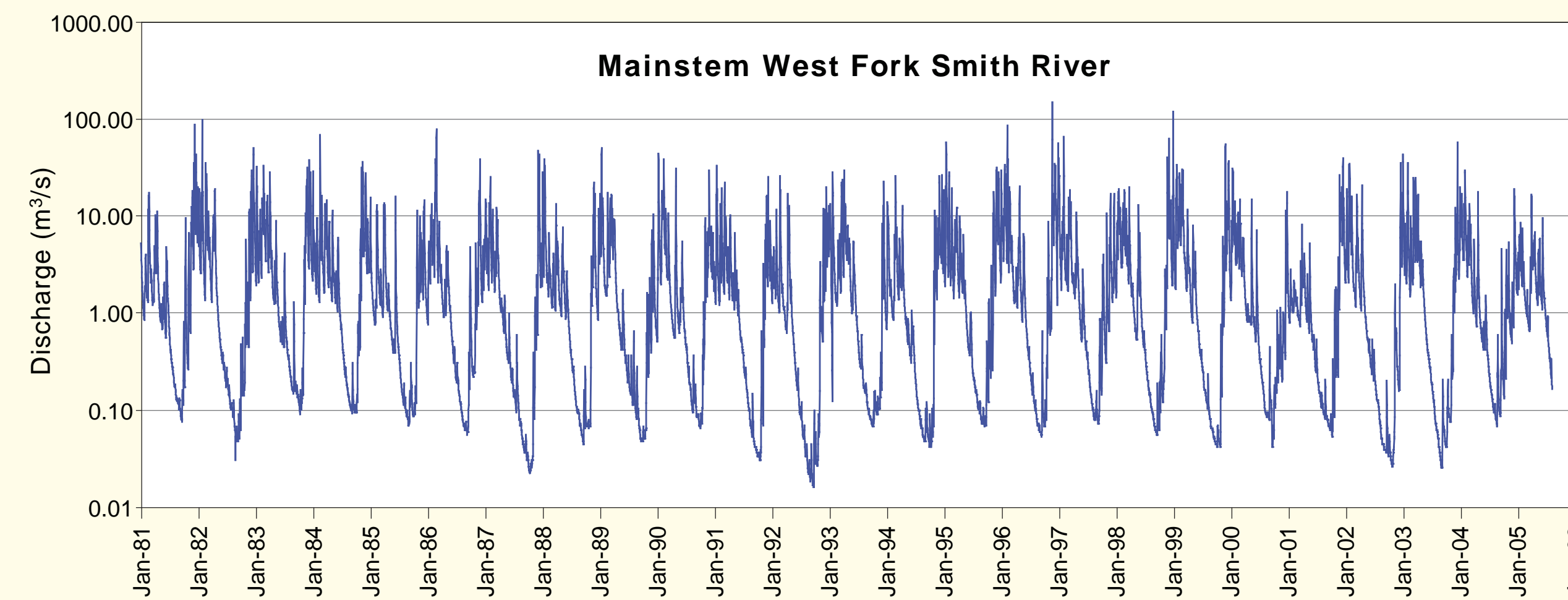


Pacific salmon are very important to Pacific Northwest ecosystems and have experienced major overall declines and extinctions. Coastal coho salmon (*Oncorhynchus kisutch*) have experienced declines similar to other Pacific salmon, and have been the focus of major restoration efforts. Coho commonly have an 18 month freshwater life cycle. Adult coho return from the ocean in late fall and spawn in the upper portions of coastal stream networks. Coho fry emerge in late winter and remain in these streams through the summer and winter before migrating (as smolts) to the ocean the following spring.

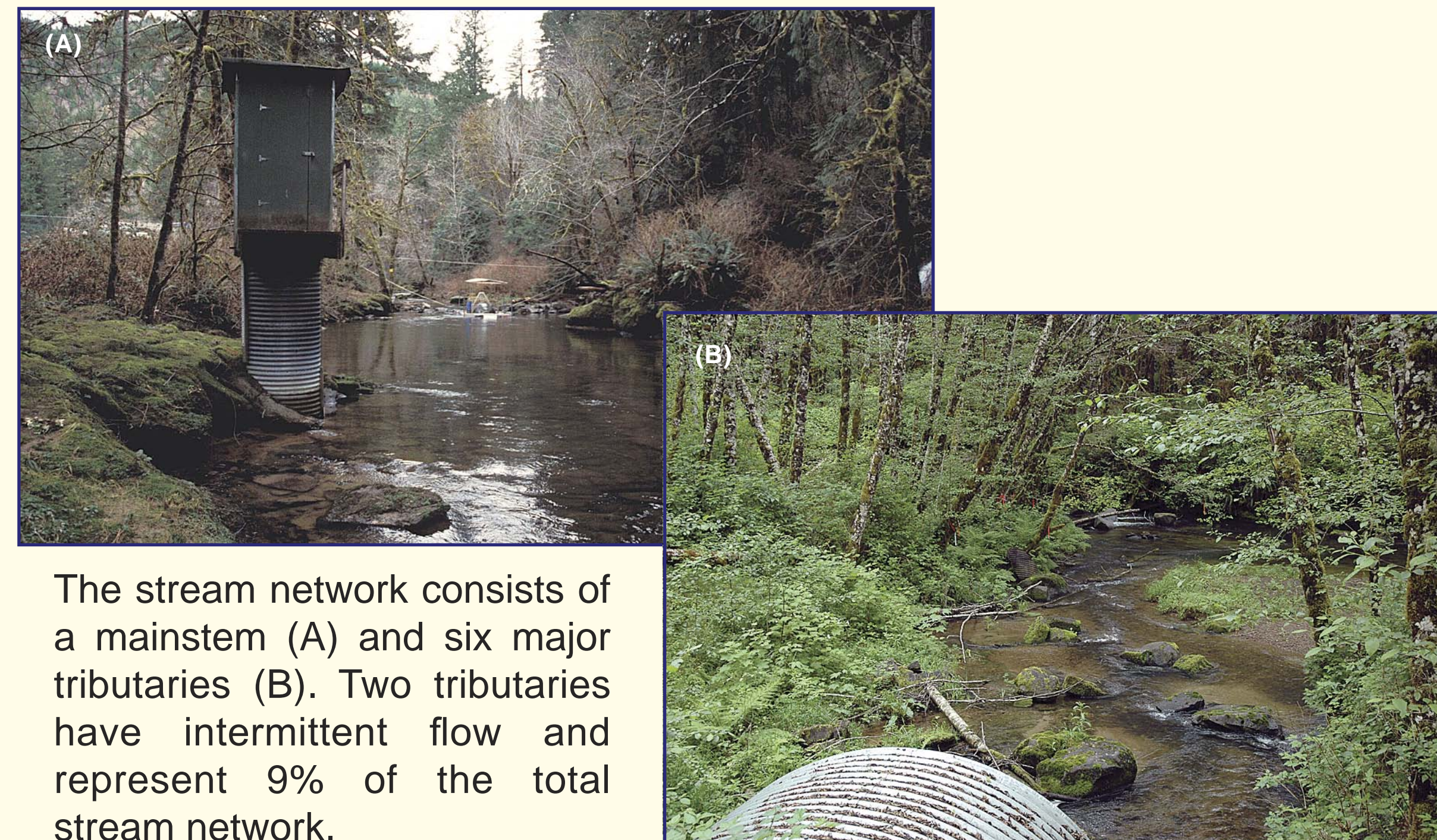
## West Fork Smith River



The West Fork Smith River (WFSR) is a 67 km<sup>2</sup> forested watershed that drains into the Umpqua River. The Oregon Department of Fish and Wildlife has monitored the out-migration of coho salmon smolts from the watershed since 1998 and has operated an adult trap since 1999. In this project, we have been studying the survival and movement of juvenile coho within the WFSR stream network since 2002 and have implanted over 19,000 wild juvenile coho with Passive Integrated Transponder (PIT) tags to track their locations and survival within the stream network.



Douglas County has continuously operated a streamflow (discharge) gaging station on the mainstem West Fork Smith River since fall 1980.

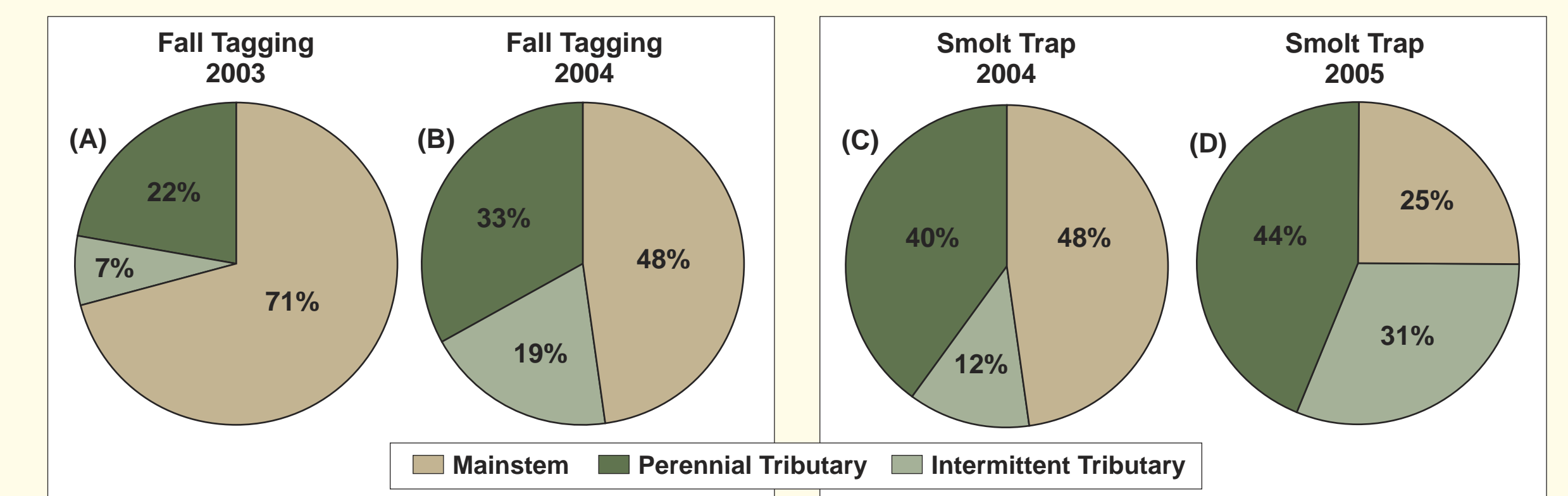


The stream network consists of a mainstem (A) and six major tributaries (B). Two tributaries have intermittent flow and represent 9% of the total stream network.

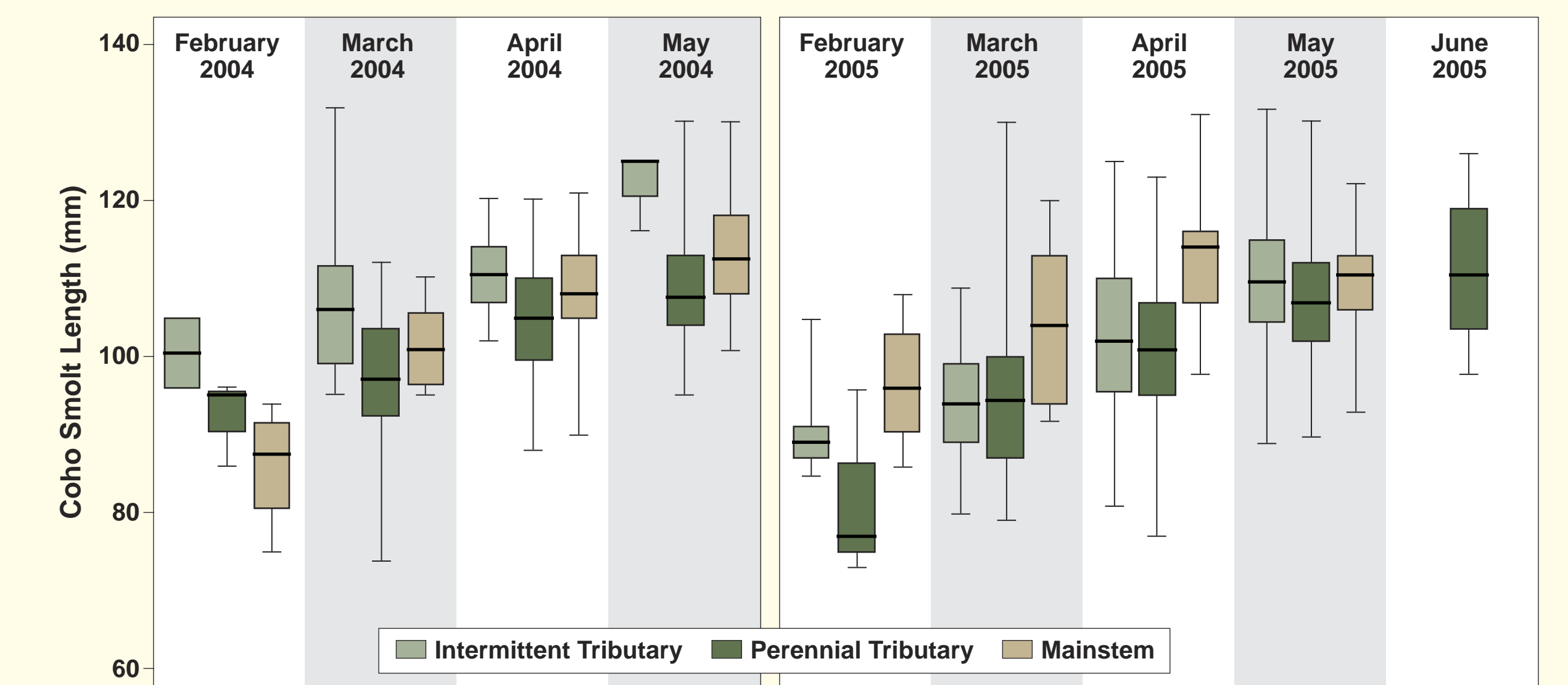


The summer of 2003 was a particularly dry season. By means of periodic streamflow measurements in the tributary streams, we were able to establish streamflow thresholds below which intermittent tributaries stopped flowing. Using these thresholds, we estimated that one or both tributaries experienced extended periods with no flow during 14 of the 24 years of streamflow record, with six years having no streamflow in intermittent streams for periods of 15 to 87 days. Since 2002, there have been two dry water years during which the intermittent streams had no flow for 22 to 62 days each year.

Intermittent streams were used by coho salmon in several ways. During 2002 - 2004, 11 to 21% of the adult coho spawned in the two intermittent streams. Intermittent streams produced 15% of the coho smolts in spring 2004 and 19% in spring 2005. The 2004 coho smolts had experienced a very dry summer in 2003, with no flow in the two intermittent streams for 46 and 62 days.



Distribution (mainstem, perennial tributary, intermittent tributary users) of tagged juvenile coho when PIT tagged in autumn (A and B) and of coho smolts when recaptured at the smolt trap (C and D).



During the driest summer (2003), coho smolts from the intermittent tributaries were longer than smolts from perennial tributaries or the mainstem. During a wetter summer (2004), mainstem smolts were the longest.

## Conclusion — Relevance

Our results show that intermittent streams provide coho habitat that is equal to or better than perennial streams. Low-gradient streams, such as those in the WFSR, are expected to be common in watersheds with sedimentary bedrock, which comprise the prime coho salmon habitat among Oregon coastal drainages. Loss of intermittent habitat would have a negative influence on coho salmon populations in coastal drainages.

This research contributes directly to the EPA Office of Water information needs regarding headwater streams. In February, 2006 the U.S. Supreme Court heard two cases that may determine whether or not intermittent streams remain within the jurisdiction of the Clean Water Act.

### Acknowledgements

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